

MEDIA-ON-DEMAND RENTAL DURATION MANAGEMENT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of Application No. 9/590,520, filed on June 9, 5 2000, and claims the benefit of U.S. Provisional Application No. 60/214,987, filed on June 29, 2000, both of which are entirely incorporated herein by reference.

FIELD OF THE INVENTION

10 This invention relates in general to television systems, and more particularly, to the field of media-on-demand.

BACKGROUND OF THE INVENTION

With the recent advances in digital transmission technology, cable television systems are now capable of providing much more than the traditional analog broadcast video. In implementing enhanced programming, the home communication terminal ("HCT"), otherwise known as the settop box, has become an important computing device for accessing video services and navigating a subscriber through a maze of available services. In addition to supporting traditional analog broadcast video functionality, digital HCTs (or "DHCTs") now also support an increasing number of two-way digital services such as video-on-demand.

Typically, a DHCT is connected to a cable or satellite television network and includes hardware and software necessary to provide the functionality of the digital television system at the client's site. Preferably, some of the software executed by a DHCT is downloaded and/or updated via the cable television network. Each DHCT also typically includes a processor, communication components and memory; and is connected to a television or other display device, such as a personal computer. While many conventional DHCTs are stand-alone devices that are externally connected to a television, a DHCT and/or its functionality may be integrated into a television or personal computer, as will be appreciated by those of ordinary skill in the art.

Media-on-demand providers present users with video presentations, such as movies, via DHCT's. However, to cost-effectively manage bandwidth and system resources, a media-on-demand title is typically rented to a user for a defined access time period and for a defined cost. This limited access period can result in many users being unable to watch on-demand media rentals in their entirety due to competing time demands and/or external distractions. Therefore, there exists a need to make it easier for users to view media-on-demand rentals in their entirety.

SUMMARY OF THE INVENTION

The invention can be viewed as a system for providing media with a rental extension option to a user via an interactive media services client device coupled to a programmable media services server device. A method of the preferred embodiment of the present invention includes receiving user input identifying a media rental having a defined rental access duration, receiving user input requesting that the access duration be extended, and extending the time period during which the user has access to the media rental.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. In the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. 1 is a block diagram of a cable television system in accordance with one preferred embodiment of the present invention.

FIG. 2 is a block diagram of selected elements of the headend depicted in FIG. 1.

FIG. 3 is a block diagram of selected elements of a DHCT and related equipment, in accordance with one preferred embodiment of the present invention depicted in FIG. 1.

FIG. 4 is block diagram of a remote control device that can be used to provide user input to the DHCT shown in FIG. 3.

FIG. 5 is a diagram depicting an example video-on-demand (VOD) rental selection window that illustrates a media rental list presented to the user by the DHCT of FIG. 3.

FIG. 6 is a diagram depicting an example rental period selection window that is presented to a user after the user selects a video title via the VOD rental selection window illustrated in FIG. 5.

FIG. 7 is a diagram depicting an example stopped video window that is presented to the user by the DHCT of FIG. 3 after the user stops the presentation of a video rental that was requested via the VOD rental selection window illustrated in FIG. 5.

FIG. 8 is a diagram depicting an example rental extension options window that is presented to the user by the DHCT of FIG. 3 after the user requests the purchase of a time extension via the stopped video screen illustrated in FIG. 7.

FIG. 9 is a diagram depicting an example PIN entry window that is presented to the user by the DHCT of FIG. 3 after the user selects a time extension option via the rental extension options screen illustrated in FIG. 8.

FIG. 10 is a diagram depicting an example confirmation window that is presented to the user by the DHCT of FIG. 3 illustrating updated media rental information.

5 FIG. 11 is a diagram depicting an example stopped video window that is presented to the user by the DHCT of FIG. 3 when the user stops a media rental for which the rental period remaining is less than the remaining playing time.

10 FIG. 12 is a diagram depicting an example limited time warning barker that is presented to the user by the DHCT of FIG. 3 after the user chooses to activate a media rental session for which the remaining rental time is less than the remaining playing time.

FIG. 13 is a diagram depicting an example rental time expiration barker that is presented to the user by the DHCT of FIG. 3 if the rental period for a media rental ends while the user is viewing the media rental.

15 FIG. 14 is a diagram of an example control menu for a system operator to configure the headend illustrated in FIG. 2 to determine how rental extension options will be implemented in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

20 The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

25 The present invention is generally implemented as part of a cable television system (CTS). Hence, an illustrative CTS 10 and its operation will be described initially. FIG. 1 shows a block diagram view of a CTS 10, which is generally a high quality, reliable and integrated network system that features video, audio, voice and data services to DHCT users. Although FIG. 1 depicts a high level view of a CTS 10, it should be appreciated that a plurality of cable television systems can tie together a plurality of regional networks into an integrated global network so that DHCT users can receive content provided from anywhere in the world.

30 The CTS 10 delivers broadcast video signals as digitally formatted signals in addition to delivering traditional broadcast analog video signals. Furthermore, the system can support one way broadcast services as well as both one-way data services and two-way media and data services. The two-way operation of the network allows for user interactivity with services, such as Pay-Per-View programming, Near Video-On-Demand (NVOD) programming according to any of several known NVOD implementation methods, View-on-Demand (VOD) programming (according to any of several

known VOD implementation methods), and interactive applications, such as Internet connections and interactive media Guide (IMG) applications.

The CTS 10 also provides the interfaces, network control, transport control, session control, and servers to access content and services, and distributes content and services to DHCT users. As shown in FIG. 1, a typical CTS 10 comprises a headend 11, hubs 12, an HFC access network 17, and users' digital home communication terminals (DHCTs) 16. It should be appreciated that although a single component (e.g. a headend) is illustrated in FIG. 1, a CTS 10 can feature a plurality of any one of the illustrated components or may be configured with alternative embodiments for any one of the individual components or with yet other additional components not enumerated above. A content provider (not shown) transmits media content to a headend for further transmission to users downstream in the network.

Content provided by a content provider is communicated by the content provider to one or more headends 11. From those headends the content is then communicated over a communications network 18 that includes a plurality of HFC access networks 17 (only one HFC access network 17 is illustrated). The HFC access network 17 typically comprises a plurality of HFC nodes 13, each of which may serve a local geographical area. The hub 12 connects to the HFC node 13 through a fiber portion of the HFC access network 17. The HFC node 13 is connected to a tap 14 which is connected to a network interface unit (NIU) 15 which is connected to a DHCT 16. The NIU 15 is normally located at a user's property and provides a transparent interface between the HFC node 13 and the users' internal wiring. Coaxial cables are typically used to couple nodes 13, taps 14 and NIUs 15 because the electrical signals can be easily repeated with radio frequency (RF) amplifiers.

As the high-level operations of many of the functions of CTSs 10 are well known to those of skill in the art, further description of the overall CTS 10 of FIG. 1 will not be contained herein. It will be appreciated, however, that the CTS 10 shown in FIG. 1 is merely illustrative and should not be construed as implying any limitations upon the scope of the present invention.

FIG. 2 is a block diagram of portions of a headend 11 that is configured to provide media-on-demand (MOD) services in accordance with one embodiment of the present invention. MOD services include, among other things, video-on-demand (VOD) services and respective MOD information suitable to be presented to a user via display of an interactive media guide. MOD server application 19 and a plurality of other server applications 20 are connected to a digital network control system (DNCS) 23 via a high-speed network such as an Ethernet connection 32. The MOD server application 19 is responsible for reserving and configuring system resources needed to provide MOD services and for providing configuration and service data to an MOD client application 63 (FIG.3), including MOD

information comprising a catalog of titles available for on-demand viewing and/or on-demand rental by a user.

The DNCS 23 provides complete management, monitoring, and control of the network's elements and broadcast services provided to users. In one implementation, the DNCS 23 uses a data insertion multiplexer 29 and a data QAM 30 to insert in-band broadcast file system (BFS) data into an MPEG-2 transport stream that is broadcast and received via DHCT's communication interface 42 and tuner system 45. The DNCS 23 also contains a session manager 34 that uses Digital Storage Media Command and Control (DSMCC) protocol to set up and maintain MOD sessions. The session manager 34 processes user to network (U-N) session signaling messages, manages allocation of session-related network resources, supports network management operations, acts as a point of contact to the network for the DHCT's 16 in the network 18 to establish individual sessions, and supports MOD services by providing the signaling interface to establish, maintain and release client initiated exclusive sessions.

A service application manager (SAM) server 25 is a server component of a client-server pair of components, with the client component being located at the DHCT 16. Together, the client-server SAM components provide a system in which the user can access services, which are identified by an application to run and a parameter, such as particular data content, specific to that service. The client-server SAM components also manage the life cycle of the applications on the system, including the definition, activation, and suspension of services they provide and the downloading of the applications into the DHCT 16 as necessary.

Applications on both the headend 11 and the DHCT 16 can access the data stored in a broadcast file system (BFS) server 28 in a similar manner to a file system found on operating systems. The BFS server 28 is a part of a broadcast file system that has a counterpart BFS client module 43 (FIG. 3) in a DHCT 16 connected to the network 18. The BFS server 28 repeatedly sends data for applications on a data carousel (not shown) over a period of time in cyclical repeated fashion so that a DHCT 16 that is in need of reading any particular data file or parts thereof may receive it when requested by a user or one or more of its internal running processes.

A VOD content manager 21 is responsible for managing the content on the VOD content servers 22. The MOD server application 19 controls both the VOD content manager 21 and the VOD content servers 22 and utilizes them to help deliver the video and audio streams that make up VOD services. In one embodiment, an MOD content manager and MOD content servers (not shown) could run respectively in parallel to the VOD content manager 21 and VOD content servers 22 to manage other types of on-demand media content. In an alternate embodiment an MOD content manager replaces the VOD content manager 21 and the MOD content servers replaces the VOD content servers 22. The QAM modulators

that comprise the QAM group 24 receive the MPEG-2 transport streams from the VOD content servers 22, convert them into encrypted RF signals at a specified frequency (channel), and transmit them to a DHCT 16 via the network 18.

The QPSK modem 26 is responsible for transporting the out-of-band IP (internet protocol) 5 datagram traffic between the distribution headend 11 and a DHCT 16. Data from the QPSK modem 26 is routed by headend router 27 within the headend 11. The headend router 27 is also responsible for delivering upstream application traffic to the various server applications 19 & 20.

FIG. 3 is a block diagram illustrating a DHCT 16 that is coupled to a headend 11 and to a television 41. Some of the functionality performed by applications executed in the DHCT 16 (such as 10 the MOD client application 63) may instead be performed at the headend 11 and vice versa. A DHCT 16 is typically situated at a user's residence or place of business and may be a stand alone unit or integrated into another device such as, for example, a television set or a personal computer. The DHCT 16 preferably includes a communications interface 42 for receiving signals (video, audio and/or other data) from the headend 11 through the network 18 and for providing any reverse information to the headend 11 through the network 18. The DHCT 16 further includes at least one processor 44 for controlling operations of the DHCT 16, an RF output system 48 for driving the television display 41, and a tuner system 45 for tuning into a particular television channel to be displayed and for sending and receiving various types of data or media from the headend 11. The tuner system 45 includes, in one implementation, an out-of-band tuner for bi-directional quadrature phase shift keying (QPSK) data communication and a quadrature amplitude modulation (QAM) tuner for receiving television signals. Additionally, a receiver 46 receives externally-generated information, such as user inputs or commands from other devices.

The DHCT 16 may also include one or more wireless or wired interfaces, also called ports, for 25 receiving and/or transmitting data to other devices. For instance, the DHCT 16 may feature USB (Universal Serial Bus), Ethernet (for connection to a computer), IEEE-1394 (for connection to media devices in an entertainment center), serial, and/or parallel ports. The user inputs may, for example, be provided by a computer or transmitter with buttons or keys located either on the exterior of the terminal or by a hand-held remote control device or keyboard that includes user-actuated buttons.

In one implementation, the DHCT 16 includes system memory 49, which includes flash memory 30 51 and dynamic random access memory (DRAM) 52, for storing various applications, modules and data for execution and use by the processor 44. Basic functionality of the DHCT 16 is provided by an operating system 53 that is primarily stored in flash memory 51. Among other things, the operating system 53 includes at least one resource manager 67 that provides an interface to resources of the DHCT 16 such as, for example, computing resources.

One or more programmed software applications, herein referred to as applications, are executed by utilizing the computing resources in the DHCT 16. Applications stored in flash memory 51 or DRAM 52 are executed by processor 44 (e.g., a central processing unit or digital signal processor) under the auspices of the operating system 53. Data required as input by an application is stored in DRAM 52 or flash memory 51 and read by processor 44 as need be during the course of the application's execution.

5 Input data may be data stored in DRAM 52 by a secondary application or other source, either internal or external to the DHCT 16, or possibly anticipated by the application and thus created with the application at the time it was generated as a software application, in which case it is stored in flash memory 51. Data generated by an application is stored in DRAM 52 by processor 44 during the course of the application's execution.

10 DRAM 52 also includes application memory 70 that various applications may use for storing and/or retrieving data.

An application referred to as navigator 55 is also resident in flash memory 51 for providing a navigation framework for services provided by the DHCT 16. The navigator 55 registers for and in some cases reserves certain user inputs related to navigational keys such as channel increment/decrement, last channel, favorite channel, etc. The client applications may be resident in flash memory 51 or downloaded into DRAM 52. The navigator 55 also provides users with television related menu options that correspond to DHCT functions such as, for example, providing an interactive program guide, blocking a channel or a group of channels from being displayed in a channel menu, and displaying a video-on-demand purchase list.

The flash memory 51 also contains a platform library 56. The platform library 56 is a collection of utilities useful to applications, such as a timer manager, a compression manager, a configuration manager, an HTML parser, a database manager, a widget toolkit, a string manager, and other utilities (not shown). These utilities are accessed by applications via application programming interfaces (APIs) as necessary so that each application does not have to contain these utilities. Two components of the platform library 56 that are shown in FIG. 3 are a window manager 59 and a client service application manager (SAM) 57.

The window manager 59 provides a mechanism for implementing the sharing of the screen regions and user input. The window manager 59 on the DHCT 16 is responsible for, as directed by one or more applications, implementing the creation, display, and de-allocation of the limited DHCT 16 screen resources. It allows multiple applications to share the screen by assigning ownership of screen regions, or windows. The window manager 59 also maintains, among other things, a user input registry 50 in DRAM 52 so that when a user enters a key or a command via the remote control device 80 or another input device such as a keyboard or mouse, the user input registry 50 is accessed to determine which of various applications running on the DHCT 16 should receive data corresponding to the input

key and in which order. As an application is executed, it registers a request to receive certain user input keys or commands. When the user presses a key corresponding to one of the commands on the remote control device 80, the command is received by the receiver 46 and relayed to the processor 44. The processor 44 dispatches the event to the operating system 53 where it is forwarded to the window manager 59 which ultimately accesses the user input registry 50 and routes data corresponding to the incoming command to the appropriate application.

The Client SAM 57 is a client component of a client-server pair of components, with the server component being located on the headend 11. A SAM database 60 in DRAM 52 includes a data structure of services and a data structure of channels that are created and updated by the headend 11. Many services can be defined using the same application component, with different parameters. Examples of services include, without limitation and in accordance with one implementation, presenting television programs (available through a WatchTV application 62), pay-per-view events (available through a PPV application 64), digital music (not shown), media-on-demand (available through an MOD application 63), and an interactive program guide. In general, the identification of a service includes the identification of an executable application that provides the service along with a set of application-dependent parameters that indicate to the application the service to be provided. As a non-limiting example, a service of presenting a television program could be executed with a set of parameters to view HBO or with a separate set of parameters to view CNN. Each association of the application component (tune video) and one parameter component (HBO or CNN) represents a particular service that has a unique service I.D. The Client SAM 57 also interfaces with the resource manager 67, as discussed below, to control resources of the DHCT 16.

Application clients can also be downloaded into DRAM 52 at the request of the Client SAM 57, typically in response to a request by the user or in response to a message from the headend. In this non-limiting example DRAM 52 contains a media-on-demand application (MOD) 63, an e-mail application 65, and a web browser application 66, among others (not shown). It should be clear to one with ordinary skill in the art that these applications are not limiting and merely serve as examples for this present embodiment of the invention. Furthermore, one or more DRAM based applications may, as an alternative embodiment, be resident in flash memory 51. These applications, and others provided by the cable system operator, are top level software entities on the network for providing services to the user.

In one implementation, applications executing on the DHCT 16 work with the navigator 55 by abiding by several guidelines. First, an application utilizes the Client SAM 57 for the provision, activation, and suspension of services. Second, an application shares DHCT 16 resources with other applications and abides by the resource management policies of the Client SAM 57, the operating

system 53, and the DHCT 16. Third, an application handles situations where resources are only available with navigator 55 intervention. Fourth, when an application loses service authorization while providing a service, the application suspends the service via the SAM (the navigator 55 will reactivate an individual service application when it later becomes authorized). Finally, an application client is designed to not have access to certain user input keys reserved by the navigator (i.e., power, channel +/-, volume +/-, etc.).

The MOD client application 63 provides the user with lists of available media titles to choose from and with video presentations requested by the user. The MOD client application 63 provides video presentations to the user by engaging, preferably, in a direct two-way IP (Internet Protocol) connection with VOD content servers 22 (FIG. 2). MOD client application 63 also preferably keeps track of rental access times and play times remaining for active on-demand media rentals and determines whether the rental access time left is sufficient for viewing the remainder of a rented media title. In an alternative embodiment, such tracking and computing steps are performed at the headend 11. It is noted that a rented title can be possibly viewed multiple times within the rented title's rental access period. Hence, the MOD client application 63 performs a "remaining time" comparison for each user-effected play cycle of a rented title during the respective rental period. When the MOD client application 63 determines that the remaining rental access time approaches the cross point in time for which the remainder of the title is not possible to be viewed in its entirety, it alerts the user to the situation via a warning barker or banner that is displayed via the television 41. Alternatively a user can be alerted via a blinking light on the DHCT 16 and/or via a sound signal.

An executable program or algorithm corresponding to an operating system (OS) component, or to a client platform component, or to a client application, or to respective parts thereof, can reside in and execute out of DRAM 52 and/or flash memory 51. Likewise data inputted into or outputted from any executable program can reside in DRAM 52 or flash memory 51. Furthermore, an executable program or algorithm corresponding to an OS component, or to a client platform component, or to a client application, or to respective parts thereof, can reside in flash memory 51, or in a local storage device connected to DHCT 16 and be transferred into DRAM 52 for execution. Likewise, data input for an executable program can reside in flash memory 51 or a storage device and be transferred into DRAM 52 for use by an executable program or algorithm. In addition, data outputted by an executable program can be written into DRAM 52 by an executable program or algorithm and be transferred into flash memory 51 or into a storage device for storage purposes. The present invention is not limited by where or how data and/or applications are stored or retrieved.

Each of the above mentioned applications comprises executable instructions for implementing logical functions and can be embodied in any computer-readable medium for use by or in connection

with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch and execute the instructions. In the context of this document, a "computer-readable medium" can be any means that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be, for example but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via for instance optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner, and then stored in a computer memory.

FIG. 4 is a non limiting example of a remote control device 80 that is used to provide user input to the DHCT 16. The arrow buttons 82 include an up arrow button 83, a down arrow button 84, a left arrow button 85, and a right arrow button 86 that are used to scroll through options and/or to highlight an option. The select button 87 may be used to select a currently highlighted option that is provided to the user. In one embodiment, the a user can press the "info" button 81 in order to cause the remaining play time and remaining rental time for a media-on-demand rental to be displayed in a non-obtrusive manner on the television screen. For instance, both remaining times can be displayed on the bottom of the television screen regardless of whether the rental title is active or in stop mode. Other buttons that are available on the remote control device will be discussed further below. Many alternative methods of providing user input may be used including a remote control device with different buttons and/or button layouts, a keyboard device, a voice activated device, etc. The invention described herein is not limited by the type of device used to provide user input.

With continued reference to FIGS. 3 and 4 throughout the remaining figures, FIG. 5 is a diagram depicting an example VOD rental selection window 100. As with other window examples discussed below, processor 44 executes program instructions of MOD client application 63 that cause it to direct the window manager 59 to create window 100 via display data that is formatted for television 41. Processor 44 stores the display data or parts thereof in DRAM 52 (as necessary) and transfers the display data to a display output system such as RF output system 48 wherein display data

is converted to respective television signals and transmitted to television 41. Of course, the scope of the invention also includes any other method of causing the described windows to appear to the user.

A user may utilize the rental selection window 100 in order to request a video-on-demand rental. Top portion 101 of example window 100 typically contains one or more headings, while the bottom portion 102 typically illustrates relevant navigation buttons available on the remote control device 80. Video rental list 103 contains the titles of video presentations, such as video title 104, that are available for rent as well as a highlighted title area 105. A user may scroll through the video rental list using the up and down arrow buttons 83 & 84 on the remote control device 80 and may request a currently highlighted video title by activating the select button 87. For example, a user may activate the down arrow on the remote control device 80 until the selection "You've Got Mail" 109 is displayed in the highlighted title area 105 and then request to see the video titled "You've Got Mail" 109 by activating the select button 87. In an alternative embodiment, activating the up and down arrow buttons 83, 84 on the remote control device 80 results in the shifting of the highlighted title area 105 rather than the shifting of the video titles. A reduced screen area 106 displays an image corresponding to the video title displayed in the highlighted title area 105. As the user scrolls through the video rental list 103, the image displayed in the reduced screen area 106 changes accordingly.

FIG. 6 is a diagram depicting an example rental period selection window 110 that is presented to a user after the user selects a movie from the rental selection window 100. The user is presented with a rental period list 111 containing rental periods 112, rental prices 113, and a highlighted selection area 115. Rental period information section 114 provides information about the rental period displayed in the highlighted selection area. A user may select a highlighted rental period by activating the select button 87 (which would begin the process of setting up a video-on-demand session for the requested movie). Alternatively, the user may cancel the rental request by activating the exit button 91.

FIG. 7 is a diagram depicting an example stopped video window 120 that is presented to the user after the user stops the presentation of the video rental that was requested via the VOD rental selection window 100 (FIG. 5). The reduced screen area 106 displays an image from the media rental that was being presented to the user prior to example window 120 being displayed. Information section 121 contains information related to the media rental associated with the image displayed in the reduced screen area 106, including numerical and graphical indications 125 as to the playing time and rental time remaining for the media rental. Rental control options list 122 contains rental control options, such as the option "Purchase time extension" 123, and a highlighted option area 124. A user can select a rental control option by using the remote control device 80. For example, a user may activate the down arrow button 84 on the remote control device 80 until the selection "purchase time

extension" 123 is displayed in the highlighted option area 124, and then request the purchase of a time extension by activating the select button 87. In one embodiment, if MOD client application 63 determines that there is insufficient rental access time remaining to view the rented title in its entirety prior to or while presenting window 120 to a user, MOD client application 63 causes the numerical and graphical indications 125 (or parts thereof) to blink in order to alert the user.

FIG. 8 is a diagram depicting an example rental extension options window 130 that is presented to a user after the user selects an option to purchase a time extension. A rental extension options list 131 contains time extension options, such as time extension option 132, and a highlighted option area 133. The user may use the remote control device 80 in a manner similar to that explained above in order to browse the rental extension options list 131 and to make a request therefrom. For example, the user may press the select button in order to request a one hour rental time extension for the media rental at a cost of \$1. All the numbers shown in the example windows are hypothetical and for illustration purposes only. The actual price of a media rental time extension may depend on various factors including consumer demand, expected bandwidth availability, duration of the time extension, and/or other business and economic considerations. In one implementation, a system operator at the headend 11 can input the prices that will be charged for rental extension via a rental extension control menu 190 illustrated in FIG. 14. In one embodiment, lack of bandwidth or system resources may prohibit the user from extending the rental period instantaneously, in which case MOD client application 63 (based on information received from the MOD server application 19) would provide the user with a choice of start times and corresponding extension periods (not shown).

FIG. 9 is a diagram depicting an example PIN entry window 140 that is presented to the user after the user selects a time extension option via the rental extension options window 130 (FIG. 8). The top portion 111 contains the heading "PIN ENTRY" while the bottom portion 112 illustrates relevant navigation buttons available on the remote control device 80. A user can enter his PIN using the remote control device 80 while being presented with the PIN entry window 140. Center portion 113 contains entry fields 114 that display a "*" for every PIN entry received from the user. In an alternative embodiment a user is not presented with a PIN entry screen and is not required to enter a PIN. In yet another alternative embodiment, a user is only presented with a PIN entry screen if the cost of a requested rental extension exceeds a predetermined threshold.

FIG. 10 is a diagram depicting an example confirmation window 150 illustrating updated media rental information. Confirmation window 150 is presented to a user after the user purchases a video rental time extension. Information section 121 contains updated information related to the media rental. For example, the numerical and graphical indications 125 reflect that the rental period

has been increased to 3 hours. In addition, the user is provided with a confirmation notice 151 about the duration and cost of the user's rental extension.

FIG. 11 is a diagram depicting an example stopped video window 160 that is presented to the user after the user stops a media rental for which the rental period remaining is less than the remaining playing time. In this example, the numerical and graphical indications 125 show that the playing time remaining is one hour while the rental time remaining is only half an hour. The user is presented with a reminder message 161 reminding the user of the remaining rental time and of the option of purchasing a rental time extension. A user may choose to purchase a time extension by using the remote control device 80 to select such option via the rental control options list 122.

FIG. 12 is a diagram depicting an example limited time warning barker 170 that is presented to the user after the user chooses to activate a media rental session for which the remaining rental time is less than the remaining playing time. Top portion 111 contains the title of the media rental while bottom portion 112 illustrates relevant navigation buttons available on the remote control device 80. Center portion 113 contains information as to the remaining playing time 171 and the remaining rental time 172 as well as a prompt 173 asking the user if the user would like to purchase a time extension. The user may choose to purchase a time extension by activating the "A" button 88 or the user may choose to watch the media rental by activating the play button 91. In an alternative embodiment, anytime that the MOD client application 63 determines that the remainder of the title cannot be viewed in its entirety, the user is presented with a barker or banner alerting the user of the situation.

FIG. 13 is a diagram depicting an example rental time expiration barker 180 that is presented to the user if the rental period for a media rental ends while the user is viewing the media rental. Top portion 111 contains the heading "RENTAL PERIOD ENDED" while bottom portion 112 illustrates relevant navigation buttons available on the remote control device 80. Center portion 113 contains a prompt 173 asking the user if the user would like to purchase a rental time extension. The user may choose to purchase a time extension by activating the "A" button 88 or the user may activate the "C" button 90, in which case the user is presented with a VOD rental selection window similar to example window 100.

FIG. 14 is a diagram of an example control menu 190 for a system operator to configure the headend 11 illustrated in FIG. 2 to determine how rental extension options will be implemented in accordance with the present invention. The system operator can use the menu to select the whether rental extension options would be available to users and how the prices charged for the extension will be determined. The system operator may enter the prices that will be charged for rental extensions or may select an automatic pricing approach. The automatic pricing approach allows for variable pricing based on supply and demand factors. The variable pricing is implemented by a pricing algorithm contained in

the MOD server application 19 and communicated over the network 18 to the MOD client application 63 which presents the pricing information to the user. The system operator may also choose whether users are presented with a limited time warning barker or a rental time expiration barker as described above.

It should be emphasized that the above-described embodiments of the present invention, particularly any "preferred embodiments", are merely possible examples of the implementations, merely setting forth a clear understanding of the principles of the inventions. Many variations and modifications may be made to the above-described embodiments of the invention without departing substantially from the spirit of the principles of the invention. All such modifications and variations are intended to be included herein within the scope of the disclosure and present invention and protected by the following claims.

Therefore, having thus described the invention, the following is claimed: